
Space Weather Forecast

Issued on Wednesday, 21 February 2024 at 12:52 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Ongoing chance of Moderate solar activity.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low throughout with only mid-range Common-class flares observed from various different places on the disc - including both the east and west limbs, and a region in the northeast of the disc. This is a large region, showing development in its intermediate spots, although this could also be due to it rotating into a clearer viewing angle. There are now just two sunspots on the visible disc. The other briefly developed a weak leading spot. We are also starting to see signs of an active returning region near the southeast limb, which may increase the risk of flaring over the next couple of days. No Earth-directed Coronal Mass Ejections (CMEs) have been observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds have been at slow speeds throughout, although with a slight increase in magnetic field. The wind speeds have varied between 270-320 km/s, with a gradual increase in recent hours to around 350 km/s. Total magnetic field strength has been weak to moderate. The north-south component was mainly weakly negative at first, before becoming mostly northward directed. Geomagnetic activity was mainly Quiet, with one Unsettled interval between 20/2100-2400 UTC.

Energetic Particles / Solar Radiation: Solar radiation was just above resting background levels but well below the S1/Minor Radiation Storm threshold.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is forecast, but with an increasing risk of Moderate activity from the large region in the northeast quadrant, perhaps also from the likely returning region just over the southeast limb.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are forecast over the next four days. Solar winds are at ambient levels, but with a slightly increased magnetic field. This may be due to a very weak fast wind from a previously undetected small coronal hole, but wind speeds are unlikely to exceed 400 km/s. Wind speeds are expected to remain at or below 400 km/s for much of the period, before another coronal hole potentially connects with Earth late on Day 4 (24 February), or perhaps after the end of this period, based on an estimated speed of 450-500km/s. Geomagnetic activity is forecast to be mainly Quiet to Unsettled, with a slight chance of Active late on 24 February under any high speed stream influence.

Energetic Particles / Solar Radiation: Solar radiation levels will continue to gradually ease towards resting background levels, with a very low risk of an increase during this period.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	1	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	35	40	45	45
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	2	1	1	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)